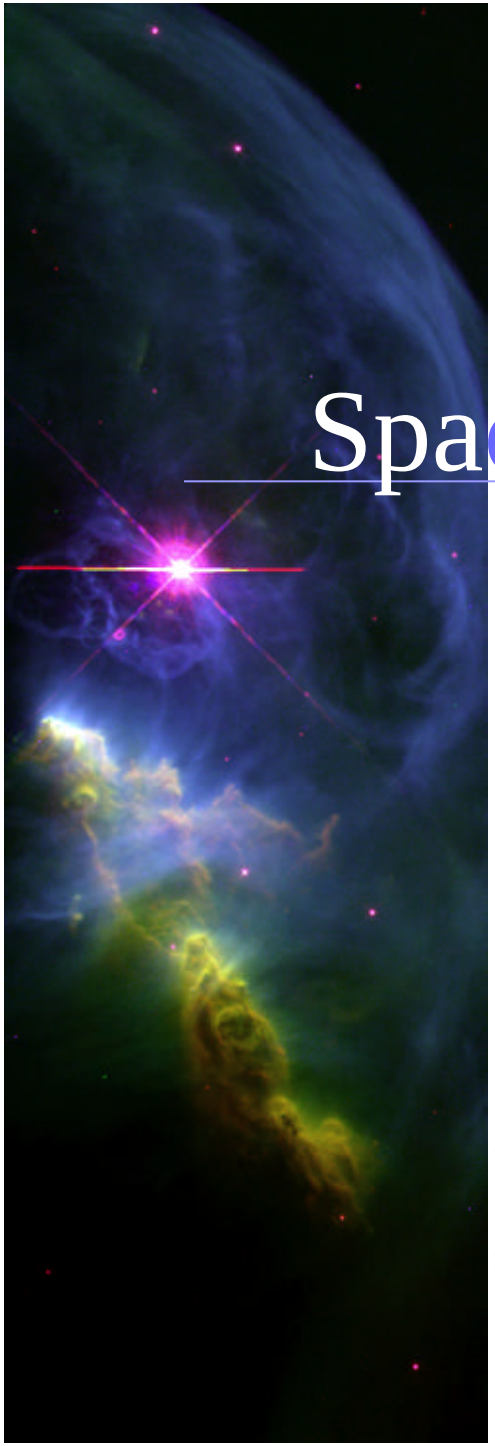

NGC 7635 "Bubble" Nebula

Space Infrared Telescope Facility (SIRTF)

Presented by

David Gallagher
Project Manager

Three Major Questions for SIRTF

1 How Common are Planetary Systems?
   - Requires the SIRTF telescope to be cold

2 How Much of the Star Formation History of the Universe is Hidden in the Infrared?
   - Requires broad wavelength coverage, large area imaging arrays, and ~arcsec spatial resolution

3 What was the Composition of the Forming Solar System?
   - Requires sensitive spectroscopic instruments based on infrared detector arrays

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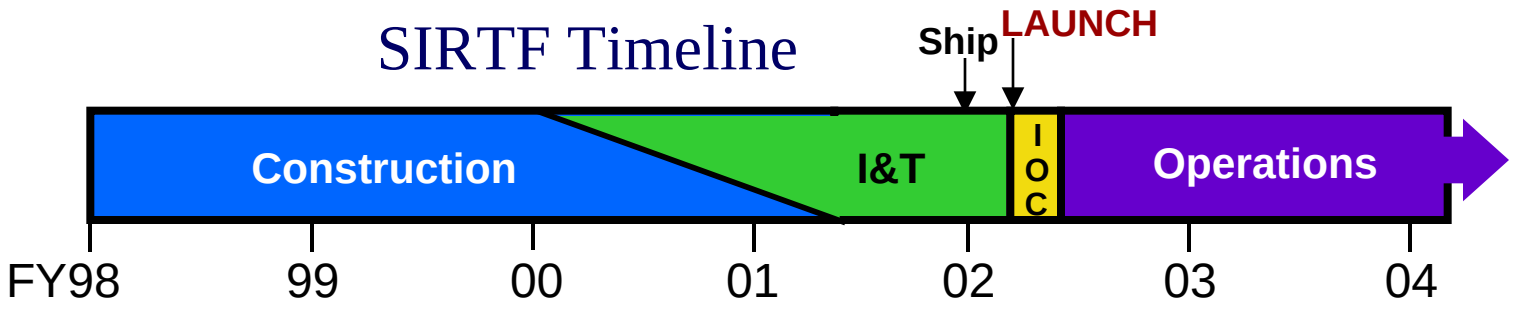

The Uniqueness of the Infrared

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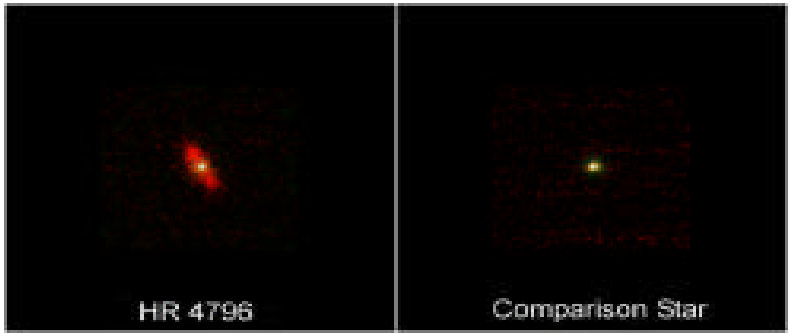
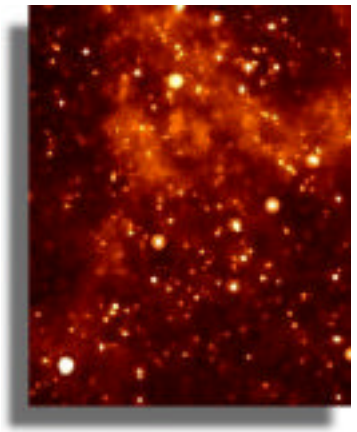
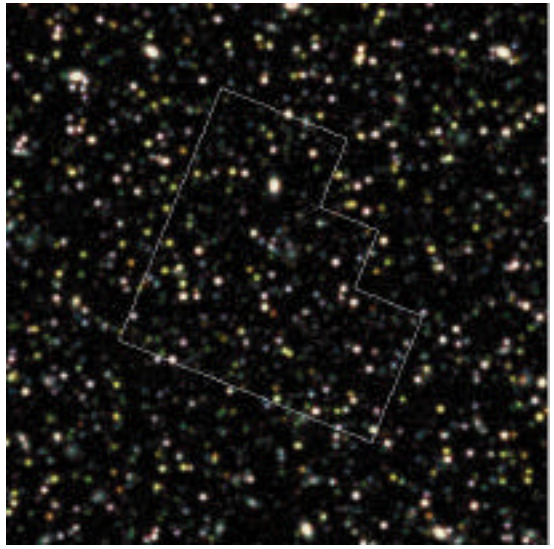
Infrared Observations Probe:



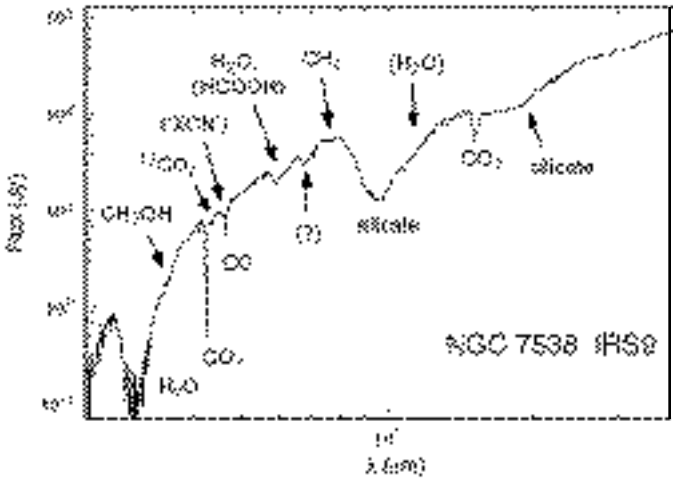
- The Cold Universe



- The Dusty Universe



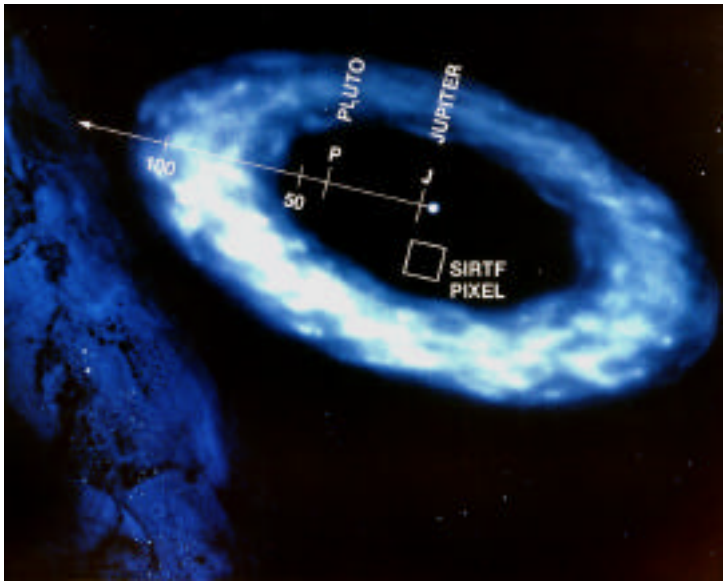
- The Distant Universe



- The Chemical Universe

SIRTF – A Major Element of the Origins Program

- SIRTF will provide key scientific results to the Origins program. SIRTF will:
  - survey nearby stars for dust disks as faint as that in our own Solar System
  - study star formation in normal galaxies to beyond z = 3
  - probe dust-obscured ultraluminous galaxies to beyond z = 5
- SIRTF demonstrates key technologies for follow-on Origins missions
  - lightweight cryogenic optics
  - high performance passive cooling
  - state-of-the-art infrared detectors
  - deep space operations



SIRTF can image solar system like dust distributions around nearby stars

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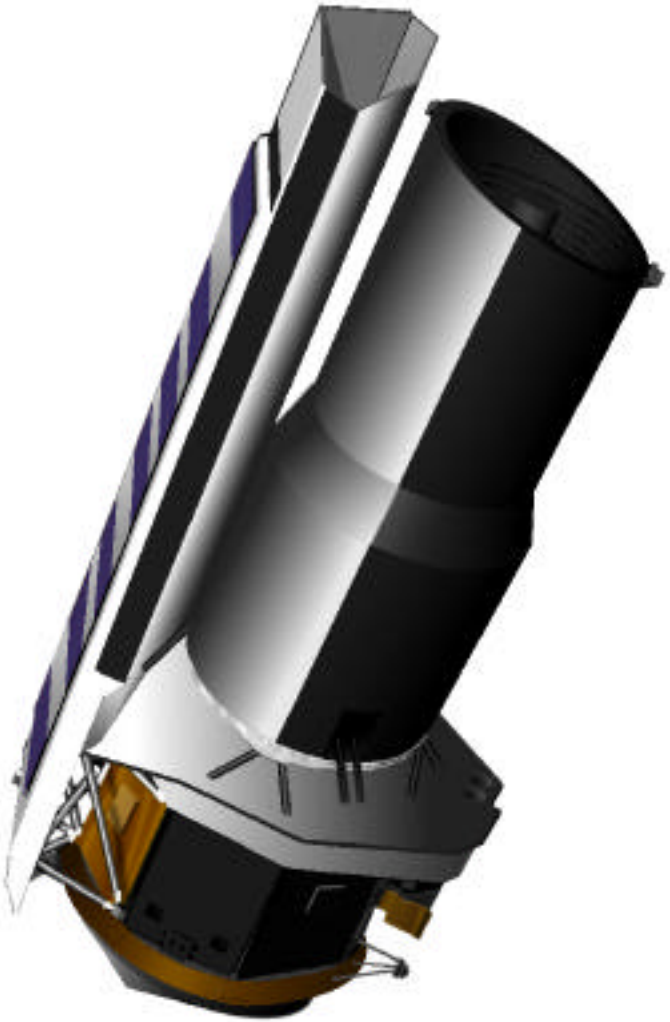

- Infrared Great Observatory
  - Background Limited Performance
    3 - 180 μm
  - 85 cm f/12 Beryllium Telescope < 5.5K
  - 6.5um Diffraction Limit
  - New Generation Detector Arrays
  - Three Focal Plane Instruments
    - Imaging/Photometry, 3-180μm
    - Spectroscopy, 5-40μm
    - Spectrophotometry, 50-100μm
  - >75% of Observing Time for the General Scientific Community
  - 2.5 yr Lifetime Requirement
  - Launch in Dec. 2001 (Delta 7920H)
  - Solar Orbit
  - $450 M Development Phase Cost Cap
- A Major Element of NASA's Origins Program

SIRTF System Architecture and Team Members

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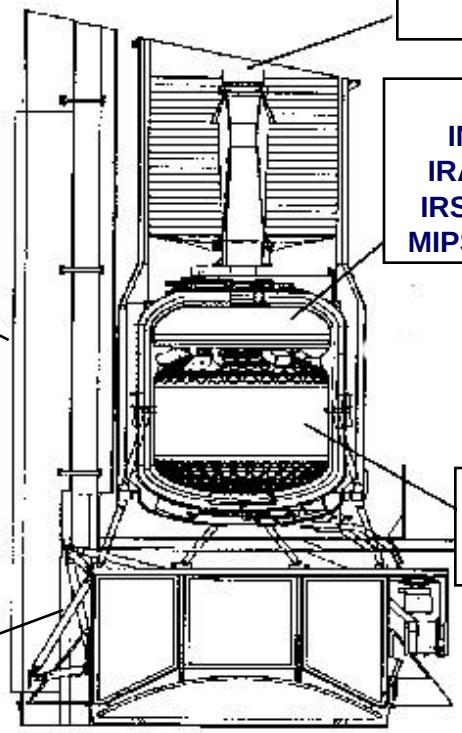
Observatory



TELESCOPE (BATC)

SCIENCE INSTRUMENTS
IRAC (SAO/GSFC)
IRS (Cornell/BATC)
MIPS (U of AZ/BATC)

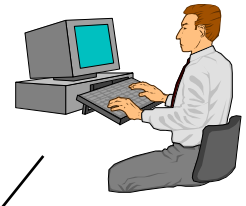
SOLAR PANEL (LMSSC)

CRYOSTAT (BATC)

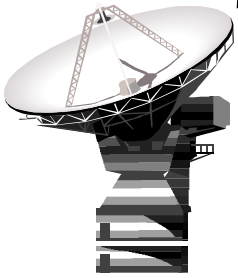
SPACECRAFT (LMSSC)

Science Community

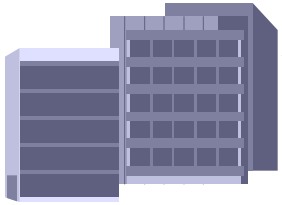
User Community



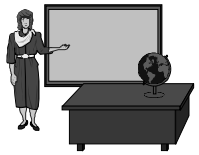
SIRTF Science Center (Caltech)



Deep Space Network



Multimission Ops. Center & Flight Operations Center (JPL)

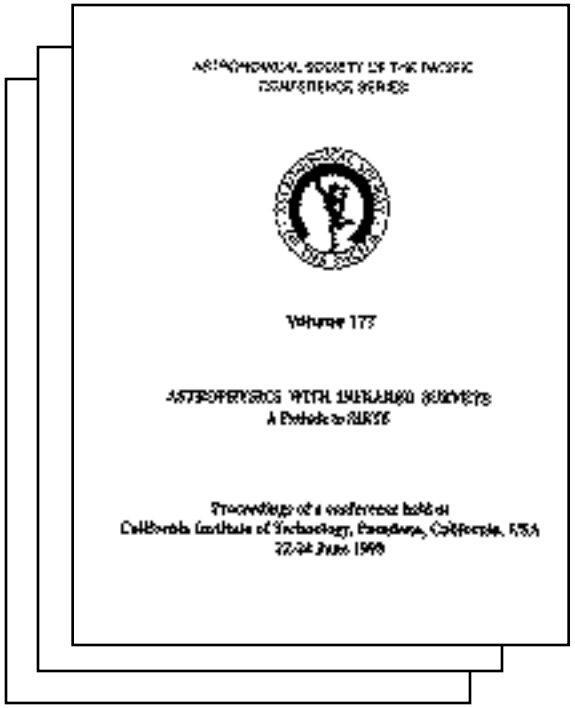


Education & Public Outreach

SIRTF – An Observatory for the Community

- Over 75% of SIRTF observing time will be awarded to the general scientific community via peer review.

- Steps taken to prepare the community include:
  - SIRTF Surveys Conference, 6/98
  - Solar System Science Workshop, 8/99
  - SIRTF Speakers' Bureau – talks to ~50 astronomy departments
  - Observation planning tools available on the WEB – 4/00
  - Leading up to Calls for Proposals:
    - Legacy Science Program – 4/00, 6/00
    - General Observer Program – 10/01



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PCA Performance Commitments

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Requirement		Status
Effective aperture diameter of the telescope	85 cm	OK
Telescope Operating Temperature	5.5K	OK
Imaging Capability	3-180 micron	OK
Spectroscopy Capability	5-100 micron	OK
Pointing Accuracy/Stability	5/0.3 arcsecond	OK
Focal Plane Instruments	3	OK
Orbit	Solar	OK
Cryogenic Lifetime: Requirement	2.5 years	OK

Highlights of the Last Year

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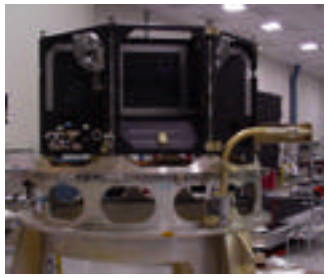
- Polishing of flight primary & secondary mirrors completed
- Test flat has been characterized
- Telescope has been assembled & aligned
- Cryotesting of telescope is underway
- Completed construction of the cryostat
- Cryostat filled with helium & performance testing completed

Highlights of Last Year (Cont.)

- Outer Shell Group Completed

- Spacecraft Static Testing Completed

- Multi-Instrument Chamber Completed



- Spacecraft Bus Structure Completed

- Facility Data System (FDS) Testing Continues
- Release of Draft Legacy Call for Proposals*
- Definition of GTO Science Programs
- Release of Science User Tools (SPOT)

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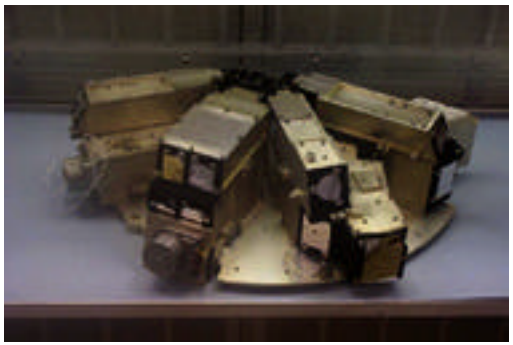
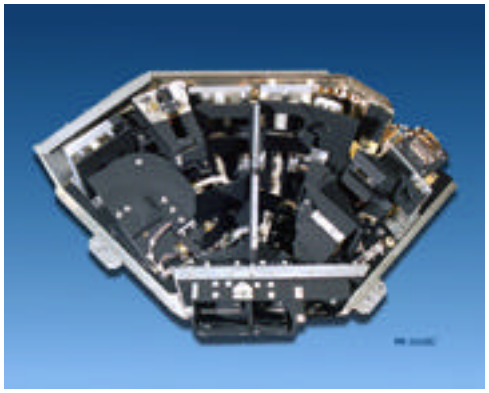
Highlights of Last Year (Cont.)

IRAC



IRS



MIPS

- Focal Planes completed
- All filters received
- Instruments built
- Performance testing completed
- Instruments Delivered*

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Highlights for the Coming Year

- Telescope complete – 5/00
- Legacy Call for Proposals – 7/00
- SIRTF IAR – 11/00
- Spacecraft Delivery – 2/01

Outer Vapor Cooled Shield

- Cryogenic Telescope Assembly (CTA) Delivery – 2/01
- Start Observatory Integration – 2/01

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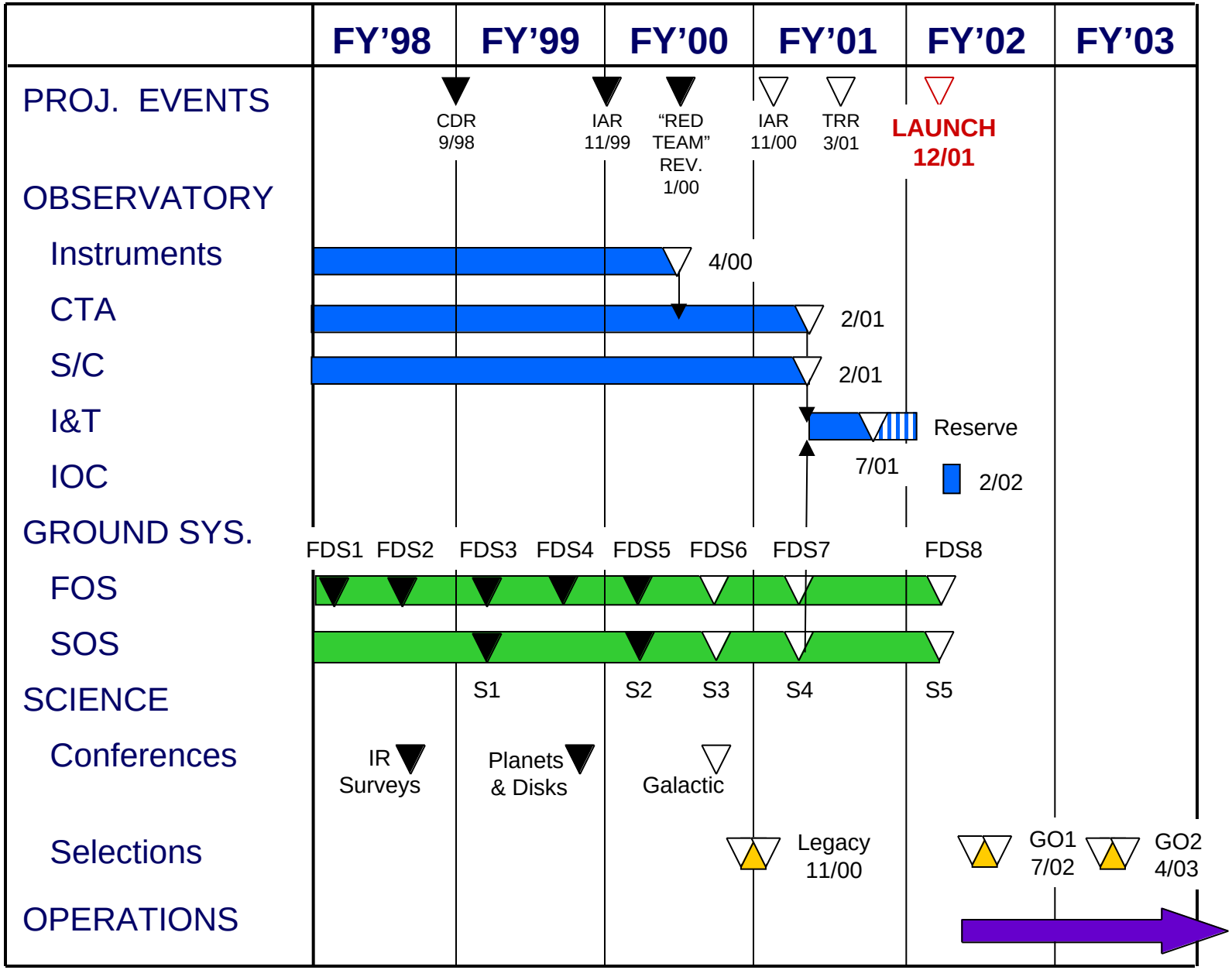
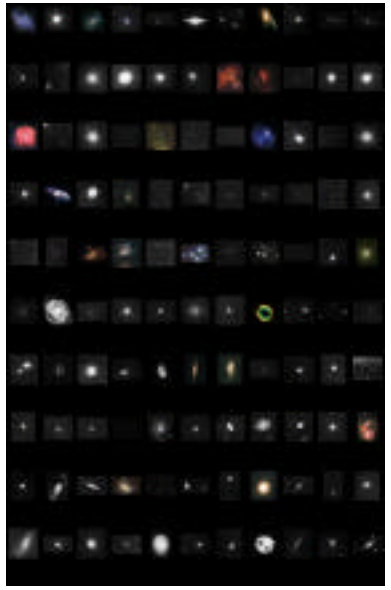
SIRTF Schedule



Education & Public Outreach

- Products Completed
  - IR Educational Video
  - Everyday use of IR
  - IR Astronomy Education Poster
  - Herschel Experiment Lithograph/Biography
  - IR Astronomy Slide Set and Booklet
  - "*Infrared Around Us*" Brochure and web site
- Products Under Review
  - NASA Fact Sheet
  - Public Affairs Plan
- Products Under Development
  - Multi-Wavelength Gallery
  - Animations to support launch activities
- Web Development
  - SIRTF for Kids (on-line, fall 1999)
  - Ask An Astronomer (on-line, fall 1999)
  - New "Science Users" area (on-line, winter 1999)
  - "Media Room" being redesigned
  - "IR Astronomy Tutorial" named *Discover Magazine* "Pick of the Month" 1/00



Messier Gallery

Infrared image of person holding burning match

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SIRTF "Red" Team Review

- Review conducted by External Independent Readiness Review (EIRR) Team
- January 24-28, 2000 at JPL
- System Leads presented system overviews
  - Tabletop format
  - Extensive inquiry and discussion
  - Cognizant Engineers participated via showstation
- ~15 in-depth Splinter sessions by request
- EIRR Chair presented report to Headquarters on March 21
- SIRTF Project Response presented to Headquarters on May 1

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Flight Software Status

- History
  - Flight Software lagging behind plan in November 1998
  - Project allocated $14M to recovery plan May 1999
    - Aggressive staffing plan successfully executed
  - Fault Protection architecture and requirements late
  - FSW metrics continue to lag plan

- Plan
  - New Program Manager for Lockheed effort on board January 2000
  - New Flight Software Manager hired mid-February 2000
  - JPL Project Manager requests Peer Review of FSW Recovery Plan
  - FSW Recovery plan Peer Review conducted April 18, 2000
  - Recovery Plan rework underway
  - Delta-Peer Review scheduled for May 2000
  - Cost and schedule impacts of replan will be evaluated following Delta Peer Review

Project Manager's Assessment

- SIRTF Development Progress Continues
  - CTA Progress Outstanding
    - Cryostat Complete (including vibration testing)
    - Telescope initial alignment and cryogenic testing complete
  - Science Instrument Deliveries*
  - Spacecraft Integration Proceeding Well
    - Bus complete and tested
    - Notable exceptions
      - Star Tracker
      - Flight Software
  - Project Reorganization Complete
    - Purpose: Increase emphasis on Operations Readiness and Training
  - "Red Team" Review Completed
  - Facility Data System (FDS) Program has been Invaluable

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For more information about SIRTF, visit our website:

http://sirtf.caltech.edu/